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# GRADE FOR INTRODUCTION OF A TEXT IN ARITHMETIC

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The supervisor who has been interested in finding out the practice of his neighbor in connection with the introduction of a text-book in arithmetic has no doubt been impressed with the fact that wide variations exist in this particular. Any investigation, covering a small number of cities only, presents such wide variations as to make it impossible to form an intelligent opinion as to the practice in this connection. However, with data from hundreds of superintendents distributed throughout the country, it is possible to make certain generalizations in regard to the prevailing practice. Professor Lotus D. Coffman of the University of Illinois, and the writer, in connection with the report of the Committee on Economy of Time in Arithmetic, received replies from 754 cities in regard to this item. The data are presented in the following tables.

TABLE I  
SHOWING GRADE IN WHICH AN ARITHMETIC TEXT IS INTRODUCED  
(by geographical divisions)

	I	II	III	IV	V	VI	Total
North Central.....	1	18	160	64	22	2	267
North Atlantic.....	2	9	122	78	15	0	227
Western.....	0	6	25	17	2	0	50
South Central.....	0	13	44	17	1	0	75
South Atlantic.....	0	4	19	5	2	0	30
Counties.....	2	16	53	28	4	3	106
	5	66	423	209	46	5	754

The meaning of Table I becomes clear when read as follows: Of the 267 cities reporting from the North Central territory, 1 introduced a text in the first grade, 18 in the second grade, 160 in the third grade, 64 in the fourth grade, 22 in the fifth grade, and 2 in the sixth grade. Again, of the 5 cities introducing a textbook in the first grade, 1 is in the North Central territory, 2 in the North Atlantic territory, and 2 in the country schools reported by the county superintendents. Of the 66 schools introducing a text-

book in the second grade, 18 were in the North Central territory, 9 in the North Atlantic territory, 6 in the Western territory, 13 in the South Central territory, 4 in the South Atlantic territory, and 16 in the counties reported by the county superintendents. Attention is directed to the wide variation as represented by isolated cases. The 5 superintendents who introduced a textbook in the first grade are at wide variance with the 5 superintendents who introduced a textbook in the sixth grade. Again the 66 superintendents who introduced a textbook in the second grade are clearly at variance with the 46 superintendents who introduced a textbook in the fifth grade. However, despite this variation, it is of distinct significance to note the fact that there is a prevailing tendency to introduce a textbook in the third grade or in the fourth grade; thus experience seems to point to these as the standard grades for the introduction of a textbook. (It should be noted that the distribution resembles the distribution to be expected by chance.)

Table II shows the same facts reduced to percentages. The third and fourth grades are even more clearly shown to be the dominant grades for the introduction of a textbook. Almost 85 per cent of the cities introduce a textbook in one or the other of these grades. In this particular there seem to be no striking differences due to geographical location, the third grade being the modal grade in each section of the country, and the fourth grade standing second in each section of the country.

TABLE II  
PRECEDING TABLE REDUCED TO PERCENTAGES

	I	II	III	IV	V	VI	Total
North Central.....	.3	6.8	60.0	24	8.2	.7	100
North Atlantic.....	.9	4.2	53.8	34.4	6.7	0	100
Western.....	0	12.0	50.0	34.	4.0	0	100
South Central.....	0	17.3	58.7	22.7	1.3	0	100
South Atlantic.....	0	13.3	63.3	16.7	6.7	0	100
Counties.....	1.9	15.2	50.0	26.4	3.7	2.8	100
	.7	8.7	56.1	27.7	6.1	.7	100

The meaning of Table II becomes clear when read as follows: In the North Central territory .3 per cent of the schools introduce a textbook in the first grade, 6.8 per cent in the second grade, 60

per cent in the third grade, 24 per cent in the fourth grade, 8.2 per cent in the fifth grade, and .7 per cent in the sixth grade.

In the absence of striking sectional differences, the question arises as to whether or not differences in the year in which a textbook is introduced may be due to the size of the city. Table III represents replies from the schools above (excluding the country schools). The meaning of this table becomes clear when read as follows: In the one city of 1,000,000 and over reporting, the textbooks are introduced in the third grade. Of the fifteen cities of 200,000 to 999,999 reporting, one introduced a text in arithmetic in the second grade, nine in the third grade, five in the fourth grade, etc.

TABLE III  
SHOWING GRADES IN WHICH ARITHMETIC TEXT IS INTRODUCED  
(by size of city)

Population	I	II	III	IV	V	VI	Total
I. 1,000,000.....	0	0	1	0	0	0	1
II. 200,000 to 999,999.....	0	1	9	5	0	0	15
III. 100,000 " 199,999.....	0	0	8	4	1	0	13
IV. 50,000 " 99,999.....	0	2	20	8	1	0	31
V. 30,000 " 49,999.....	0	2	22	12	3	0	39
VI. 20,000 " 29,999.....	1	1	26	11	3	0	42
VII. 15,000 " 19,999.....	0	1	30	9	1	0	41
VIII. 10,000 " 14,999.....	0	10	45	26	7	0	88
IX. 8,000 " 9,999.....	0	4	41	25	7	2	79
X. 4,000 " 7,999.....	2	29	168	81	19	0	299
	3	50	370	181	42	2	648

It is interesting to note that the variations are in the smaller cities. All the cities introducing arithmetic in the first grade are in towns with a population of 30,000 or less. Four-fifths of the cities introducing a textbook in arithmetic in the second grade are in cities of 15,000 or less. Three-fourths of the cities introducing a textbook in arithmetic in the fifth grade are in towns of 15,000 or less. The variation is revealed even more clearly in the table of percentages (Table IV).

The meaning of this table becomes clear when read as follows: In cities of 1,000,000 population or over, 100 per cent introduce a textbook in the third grade; in cities of 200,000 to 999,999 population, 6.7 per cent introduce a textbook in the second grade, 60 per cent in the third grade, 33.3 per cent in the fourth grade, etc.

Here again it is noteworthy that experience has been so standardized that in cities of every size, the third grade is the modal grade for the introduction of a textbook, with the fourth grade standing second.

TABLE IV

TABLE III REDUCED TO PERCENTAGES

Population		I	II	III	IV	V	VI	Total
I.	1,000,000.....	0	0	100.	0	0	0	100
II.	200,000 to 999,999.....	0	6.7	60.	33.3	0	0	100
III.	100,000 " 99,999.....	0	0	61.5	30.7	7.8	0	100
IV.	50,000 " 99,999.....	0	6.5	64.5	25.8	3.2	0	100
V.	30,000 " 49,999.....	0	5.2	56.4	30.7	7.7	0	100
VI.	20,000 " 29,999.....	2.4	2.4	61.8	26.2	7.2	0	100
VII.	15,000 " 19,999.....	0	2.5	73.2	21.8	2.5	0	100
VIII.	10,000 " 14,999.....	0	11.3	51.1	30.	7.6	0	100
IX.	8,000 " 9,999.....	0	5.2	51.9	31.7	8.7	2.5	100
X.	4,000 " 7,999.....	.8	9.6	56.2	27.1	6.3	0	100
		.6	7.7	57.1	28.	6.2	.4	100

From the foregoing presentation of replies from the superintendents distributed throughout the various parts of the United States, and throughout the cities of different size, we can arrive at the following conclusions: a superintendent who introduces a textbook as early as the first or second grade, or who postpones the introduction of such text as late as the fifth or sixth grade will do so in the face of generalized practice at the present time. While we do not know absolutely the best time to introduce a textbook in arithmetic from the standpoint of scientific investigation, because very little investigation has been made thus far in this connection, we do know that in the experience of the thousands of teachers and of the hundreds of superintendents represented in this study, the third grade is the best grade for the introduction of this subject, with the fourth grade standing second. It would be of great administrative importance for us to know about the results obtained in arithmetic work that is done in a school which postpones the introduction of a textbook until the fifth or sixth grade. From an investigation of isolated instances, where the textbooks have been introduced very late, we have reason to believe that much of the arithmetic work which is commonly associated with the textbook is done at about the same time that it would have been done had the

textbook been introduced. In other words, the extreme postponement indicated in Table IV in all probability represents an attempt to get away from the use of the textbook, rather than an attempt to get away from the actual teaching of arithmetic. Again the students of this problem are concerned with the question as to which is the better grade for the introduction of a text, the third or the fourth grade. This can only be determined by careful tests, but the amount of time to be saved is of sufficient importance to justify the attempt to determine the better practice. This experimentation is going on, as is shown in the foregoing tables. What is needed now is a thoroughgoing co-operative investigation of results attained under the different systems.

The advocates of the policy of concentration of the energy of the school toward the mastery of reading in the first three grades have much to encourage them in this report. If a third of the schools are already postponing the introduction of a textbook in arithmetic until the fourth grade, there need be little difficulty in getting more time for reading during the first three grades.

The fact that the introduction of a textbook in arithmetic is as late as it is no doubt represents a more or less conscious acceptance of the theory proposed by the psychologists a few years ago that formal instruction in arithmetic be postponed until a later period in the life of the child.

On the other hand, the student of educational administration who takes cognizance of the wide variation in age and maturity of the children in a particular grade may be led to question the advisability of postponing formal instruction in arithmetic until the upper grades. Again, the student who is conscious of the enormous amount of elimination which goes on in the early grades may question the policy of allowing children to postpone the introduction of a textbook in arithmetic until so near the close of their scholastic career.

The school superintendent needs the help of the experimental educationist in finding out whether or not the variation in time of introducing the textbook in arithmetic is paralleled by the variation in arithmetical efficiency. Is not this a problem of sufficient practical importance to challenge the student of educational administration?